BEng (Hons) Electronic Systems Engineering (Distance Learning)

Programme Specification

Primary Purpose

Course management and quality assurance.

Secondary Purpose

Detailed information for students, staff and employers. Current students should refer to the related Course Handbook for further detail.

Disclaimer

The University of Portsmouth has checked the information given in this Programme Specification and believes it to be correct. We will endeavour to deliver the course in keeping with this Programme Specification but reserve the right to change the content, timetabling and administration of the course whilst maintaining equivalent academic standards and quality.

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Contents

Course Details

1. Named Awards

Electronic Systems Engineering

2. Course Code (and UCAS Code if applicable)

C2177/P (2 year mode) and C2404/P (3 year mode)

3. Awarding Body

University of Portsmouth

4. Teaching Institution

University of Portsmouth

5. Accrediting Body

N/A

6. QAA Benchmark Groups

Engineering (updated February 2015)

7. Document Control Information

R2.2 September 2018

8. Effective Session

2018-19

9. Author

Dr EJM Geddes

10. Faculty

Technology

11. Department

School of Energy and Electronic Engineering

Curriculum

12. Educational Aims

The course aims to equip students to work as professional electronic engineers by building on an existing Foundation Degree (FD) / HND or equivalent qualifications appropriate to electronic engineering. This course comprises 120 credits of study at level 6 by on-line distance learning and leads to a BEng (Hons) award. 2 and 3-year programmes are available; the course should not normally take longer than three years, although students occasionally require a longer period, depending on their personal circumstances.

13. Reference Points

The underlying philosophy of the programme is to provide a sound engineering educational base for students wishing to enhance their existing qualifications up to honours degree level. The content of the course is broadly similar to IET accredited courses offered by the School, although since the programme is equivalent to a one-year full-time programme, it is not accredited by the IET. The proposed programme is compatible with similar courses offered in the School and other institutions within the UK. Students joining the course will already have studied material to level 5 threshold standards in their preceding FD, HND or equivalent qualifications.

Reference Points:

- The scholarship and research expertise of academic members of staff
- University of Portsmouth Curriculum Framework Document 2012
- QAA Quality Code for Higher Education
- Framework for Higher Education Qualifications (FHEQ) National Qualifications Framework
- QAA Engineering Benchmark Statement (February 2015)
- UK Standard for Professional Engineering Competence (UK-Spec) 2013
- Engineering Council Accreditation of Higher Engineering Programmes (AHEP3)

14. General Learning Outcomes

Bachelor's degrees or Bachelor's degrees with honours are awarded to students who have demonstrated:

- a systematic understanding of key aspects of their field of study, including acquisition of coherent and detailed knowledge, at least some of which is at, or informed by, the forefront of defined aspects of a discipline
- an ability to deploy accurately established techniques of analysis and enquiry within a discipline
- conceptual understanding that enables the student:
  - to devise and sustain arguments, and/or to solve problems, using ideas and techniques, some of which are at the forefront of a discipline
  - to describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in the discipline
- an appreciation of the uncertainty, ambiguity and limits of knowledge
- the ability to manage their own learning, and to make use of scholarly reviews and primary sources (for example, refereed research articles and/or original materials appropriate to the discipline)

Typically, holders of the qualification will be able to:

- apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects
- critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution - or identify a range of solutions - to a problem
- communicate information, ideas, problems and solutions to both specialist and non-specialist audiences

And holders will have:

- the qualities and transferable skills necessary for employment requiring:
  - the exercise of initiative and personal responsibility
  - decision-making in complex and unpredictable contexts
- the learning ability needed to undertake appropriate further training of a professional or equivalent nature

The core elements of the QAA engineering benchmark and AHEP3 in the context of this course are:

Science and Mathematics (SM)

Mathematical methods appropriate to electronic design, with particular reference to the methods required in analogue electronics, control systems, communications and signal processing.

Engineering Analysis (EA)

The application of mathematical and scientific principles underlying the solution of practical problems in electronics and electronic design, including the principles governing: analogue circuits and systems; digital systems, including hardware description languages; control systems and telecommunication systems.

Design (D)

The principles and practice of the design of electronic systems, relevant ITC principles including computer aided simulation and design using such software tools as VHDL and Matlab®.

Economic, Legal, Social, Ethical and Environmental Context (EC)

Business and management practices in industry with a particular focus on project management, operations management and quality management. Sustainability and environmental considerations.

Engineering practice (EP)

Solution of engineering problems to meet specified technical requirements as well as time and resource constraints. Project management methods, including planning, monitoring, control, and reporting.

15. Learning Outcomes

A. Knowledge and Understanding of:

A.1 Analogue electronics, digital electronics, data communications, signal processing, control (SM, D, and EA).
A.2 Mathematical methods appropriate to electronics (SM).
A.3 The role of computing and simulation in the solution of problems, including hardware description languages (SM, D, and EP).
A.4 Practical design of electronic systems (D, EP).
A.5 Project, operational and quality management (SM, EC).

B. Cognitive (Intellectual or Thinking) Skills, able to:

B.1 Select and apply appropriate knowledge of electronic principles to model and analyse systems (EA, EP).
B.2 Select and apply appropriate mathematical methods to model and analyse electronic systems (SM).
B.3 Select and apply computer-based design and simulation techniques (EA, D, and EP).
B.4 Design, simulate and test electronic systems and subsystems to meet specified requirements (D, EP).
B.5 Solve problems in a systematic and manageable manner (EC, EP).

C. Practical (Professional or Subject) Skills, able to:

C.1 Apply relevant mathematical methods in developing solutions to problems in electronics (SM).
C.2 Design, simulate and evaluate electronic engineering systems (D, EP).
C.3 Search a range of sources for information pertinent to technical and professional tasks (SM, EC, and EP).
C.4 Plan, manage and undertake an engineering project, taking into account constraints (SM, EC, and EP).

D. Transferable (Graduate and Employability) Skills, able to:

D.1 Manipulate and present information (EP).
D.2 Analyse scientific information in the solution of problems (SM).
D.3 Use information technology to handle text and data and for simulation and design (D).
D.4 Develop solutions in a creative manner, sometimes based on inadequate information (EA, D, and EP).
D.5 Communicate effectively in a variety of formats (EP).
D.6 Work effectively to achieve goals (EP).

16. Learning and Teaching Strategies and Methods

Knowledge (A1, A2, and A3) is acquired through lectures and independent study of the core material, design projects, simulation and computer-based activities. Directed reading, tutorial questions, worked examples and design problems support individual learning. There is extensive timetable tutorial support throughout the curriculum. Practical design considerations (A4) are learned through guided study material, project work and simulations. The business and management aspects and social context (A5) are developed through guided study material and the project.

Intellectual and analytical skills (B1, B2) are developed through guided study, design and simulation work, case studies and worked examples. The ability to apply knowledge to achieve viable solutions (B3, B4, and B5) is acquired through simulation activities and the final project.

Skills in experimentation, instrumentation and circuit construction and test will already have been developed in previous HND study.

Analytical and design exercises develop the ability to apply mathematics appropriately (C1). Use is made of CAD software to synthesize, simulate and evaluate complex designs (C2). The ability to research, plan and manage project work (C3, C4) is acquired through the individual project.

The emphasis is generally on learning through planning and carrying out simulation and project work and written reports (D1, D2, D3, and D5). Scientific and mathematical techniques (D1, D2) and familiarity with IT systems (D3) permeate the course. Problem solving and effective working (D4, D6) are developed through unit-based design problems and the individual project. Communication skills (D5) are refined via a series written reports, including a project report, and by a formal project presentation.

17. Assessment Strategy

Testing of core knowledge (A1, A2) is through a mix of examinations, assignment work and tests (some of which may be computer based). Project, practical (A4, A5) and simulation work (A3) are assessed by the submission of reports.

Cognitive skills are assessed through computer-based examination (B1, B2), assignment work and project reports (B3, B4, and B5).

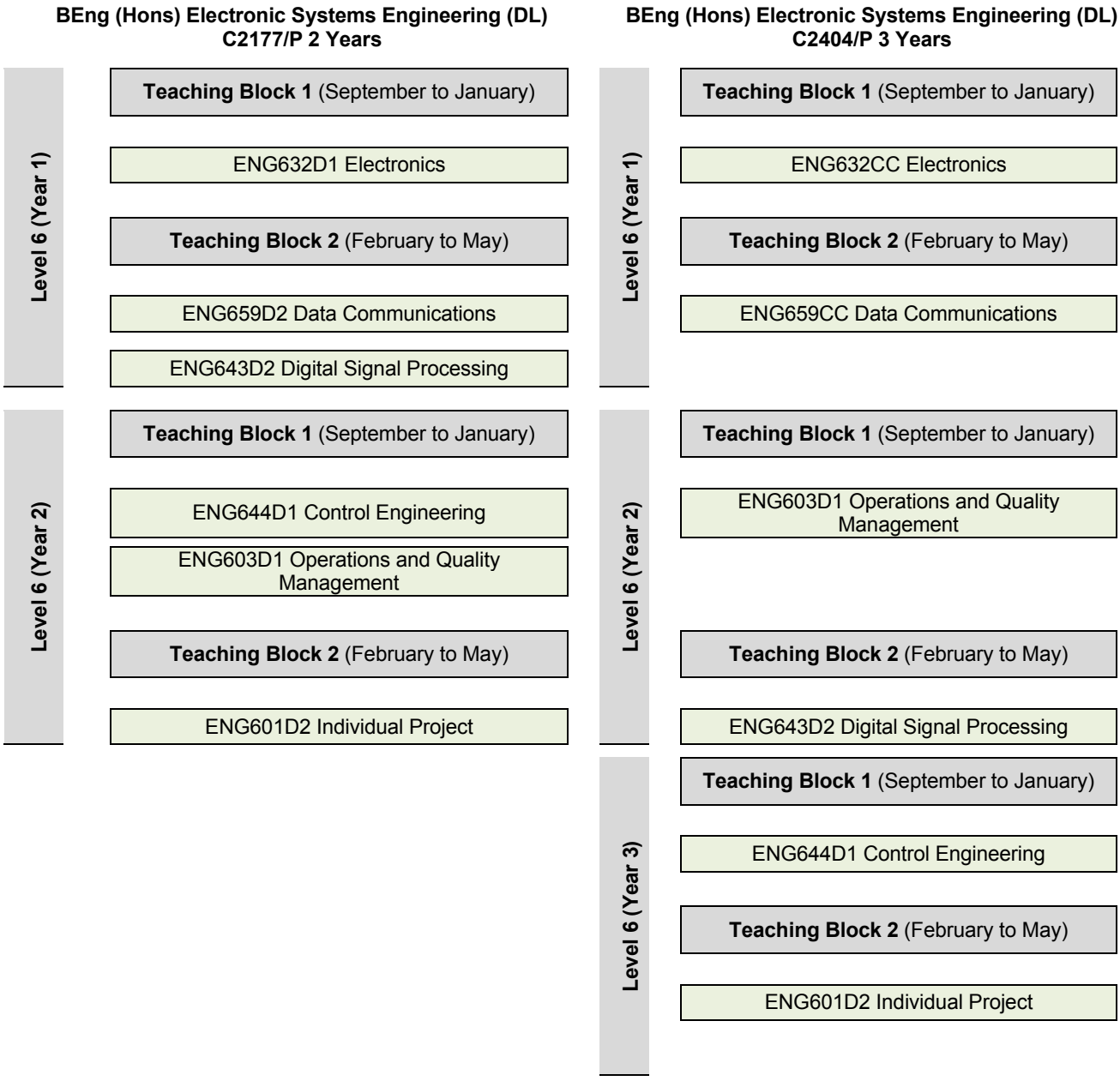
Application of mathematics (C1) is generally assessed by examination (which is computer based) but also by submission of reports. Simulation work and projects (C2, C3, and C4) are generally assessed by submission of reports.

Transferrable skills are particularly demonstrated through design activities (D1, D2, and D4) and projects (D1, D2, D3, D4, D5, and D6) and their associated reports and presentations. The abilities to solve problems (D3) are also assessed in computer-based examinations.

18. Course Structure, Progression and Award Requirements

See Unit Web Search[1] for full details on the course structure and units.

[1] www.port.ac.uk/unitwebsearch



Standard University rules apply. The Academic Regulations must be consulted for a full description of exit awards.

Students must achieve 120 level 6 credits for an Honours degree.

Students who withdraw from the programme and who registered for the programme prior to the 2016-17 academic year, having achieved at least 60 level 6 credits shall be awarded an Ordinary degree. Changes to the University University's Recognition or Prior Learning[2] (RPL) processes means that students who registered for the programme for the 2016-17 academic year or later, must achieve 100 credits in order to be awarded an Ordinary degree upon withdrawal.

This course consists of 120 credits of level 6 material available in e-learning format. Students are not expected to attend the University.

[2] RPL policy may be found at:
http://www.port.ac.uk/accesstoinformation/policies/accreditationofpriorlearning/filetodownload,190742,en.pdf

A mentor at their workplace who will provide student with general guidance can be beneficial, although is not required. Access to staff at Portsmouth will be via the virtual learning environment.

A student with few other commitments could complete the course in one year, although at the current time the programme is not offered in this “full time” mode. Students may enrol to follow a two year programme (C2177) or a three year programme (C2404).

There are no electives in this top-up course. Careers information is not given as students on the course will generally be in employment and will have specifically chosen the course to enhance their careers. Links with the students’ employers will be primarily through the work-based mentors where practical. All units are directly applicable to employment, with the project being the one with the most immediate equivalence to the work environment. Students are encouraged to propose project topics linked to their current employment where appropriate.

The School has an Industrial Liaison Officer whose particular role is to maintain contact with employers, although most staff maintain good industrial and research links.

19. Employability Statement

This course is generally designed for practising Engineers with FD degrees, HND or equivalent experience and qualifications based in the Armed Forces or mature and recently qualified engineers based in large and small industrial companies in the technology sector, whose employment or commitments may not allow them to commit to a full-time course on-campus, but who, nevertheless, wish to obtain the transferable skills, knowledge and qualifications to enhance their career development in electronics and technology management.

Examples of typical Armed Forces personnel are: Royal Navy HMS Collingwood (Portsmouth) staff and ‘Flagship’ apprentices based in industry but also having studies the RN Foundation Degree at HMS Collingwood and British Army students who have successfully completed the BSc Electronic Systems Engineering at, for example DSEME Lyneham (formerly DSEME Arborfield), who wish to top-up their BSc degree by registering for this DL course leading to the award of a BEng (Hons). Typically Portsmouth Naval Base staff are posted in Portsmouth for two years and are then re-posted. A two year part-time course programme leading to degree qualification recognised by industry in general, has particular attraction for them when, after completing their service in the armed forces, they need to consider a career in industry. This kind of scenario could be applied to many engineers serving in the Armed Forces in general.

The course may also be attractive to students in employment overseas and who may have qualifications to FD, HND or equivalent standard in an appropriate discipline, and who wish to study a technical degree in English. The Distance Learning delivery means they may obtain an honours degree standard qualification from a British University without the necessity to reside or study in Britain.

Course Management

20. Support for Student Learning

- Academic support for students is provided by staff in the School of Engineering. Unit lecturers have responsibility for facilitating study on the unit for which they have been given responsibility. Each student will be assigned a Personal Tutor from the academic staff who can give general academic advice and guidance.
- The Course Leader has overall responsibility for the academic study programme.
- Administrative support for students is provided by a Course Administrator within the School of Engineering Administration Office. The Course Administrator is the first port of call within the University on any issue not related to the academic content of the course. The Course Administrator will deal with matters directly if possible, but will otherwise forward the request to the appropriate member of academic or student support staff.

- Local support can be provided by a workplace mentor. The Faculty of Technology provides guidance for mentors.
- Pastoral support will be that normally provided by the mentor and employer, but access to University pastoral support is available for students able to access it. Access will be arranged via the Course Administrator as required. Each student has a personal tutor, who can provide pastoral support and guidance.
- University support services include careers, financial advice, and counselling.
- The Academic Skills Unit (ASK)
- The Additional Support and Disability Advice Centre (ASDAC)
- The technical medium through which the course is delivered to on-line students is the University's virtual learning environment (VLE). This is an implementation of Moodle (http://www.moodle.org) This includes mechanisms for: presenting study material at a managed pace; providing students with formative work including exercises, quizzes and design activities; presenting summative coursework to students and collecting their responses; providing formative and summative on-line tests; configuring and managing discussion forums and on-line chat sessions.
- Simulation activities will require appropriate software to be running on the student's local computer, the main package being Matlab® (student edition). Students are able to download a copy under the University's licensing agreement. A VHDL package – ModelSim®[3] and OpNet simulation may also be required, both are freely available.
- A VLE-based Induction programme and student handbook focuses on the needs of distance-learning students.
- Students will participate in on-line discussions with their peers and with their unit lecturers on each of the units in the course.
- Supplementary synchronous chat sessions will provide additional on-going academic support. Where a student has periods of time when on-line access is limited, the mentor can play a more significant role in guidance and providing a sounding board for ideas.
- Students are expected to have adequate Internet access in order to follow the course. Where a student has periods of time when on-line access is limited, some material can be provided in CD form to help them to maintain progress. Provision of material this way is a temporary measure, not intended as an alternative way to study the course, and is not a substitute for on-line participation. It is not possible to provide all of the course materials in an off-line/CD format.
- Students will also need to have simulation and CAD software loaded/installed onto their computers, so must have access rights or local support for this.
- The University of Portsmouth has consistently been awarded an excellent rating for student support and guidance in a number of Quality Assurance Agency inspections.
- Student course and unit handbooks provide information about the course structure and University regulations etc.
- Written feedback is provided for all assessments.

21. Admissions Criteria

A. Academic Admissions Criteria

Entry to this level 6 top-up requires an appropriate HND, Foundation Degree or equivalent qualifications which will be assessed by the School's admissions tutor.

[3] https://www.mentor.com/company/higher_ed/modelsim-student-edition

For applicants whose first language is not English, a minimum IELTS grade of 6.0 is required.

B. Disability

The University makes no distinction in its admissions policy with regard to disability and will endeavour to make all reasonable adjustments in order to make it possible for students to study at Portsmouth on a course of their choice.

22. Evaluation and Enhancement of Standards and Quality in Learning and Teaching

A. Mechanisms for Review and Evaluation

- Course Leader's Annual Standards and Quality Evaluative Review
- Head of Department's Annual Standards and Quality Evaluative Review
- Unit and Course Level student feedback considered at Board of Studies
- Unit Assessment Board consideration of student performance for each programme
- Annual Standards and Quality Reports to Board of Studies, including consideration of Subject and Award External Examiner Reports
- Periodic Programme Review
- Student Representatives and Student/Staff Consultative Committees
- National Student Survey
- Staff Performance and Development Review
- Peer Review and Development Framework
- Faculty Learning and Teaching Committee

B. Responsibilities for Monitoring and Evaluation

- Unit Co-ordinators for unit content and delivery
- Course Leader for day-to-day running of course
- Board of Studies with overall responsibilities for operation and content of course
- Head of School
- Associate Dean (Academic)
- Associate Dean (Students)
- Quality Assurance Committee
- Unit, Award and Progression Board of Examiners

C. Mechanisms for Gaining Student Feedback

- Student Representation on Board of Studies
- Student Staff Consultative Committees
- Unit and Course level student feedback questionnaires
- University participates in external student surveys, e.g. National Student Survey (NSS), Postgraduate Taught Experience Survey (PTES), Postgraduate Research Experience Survey (PRES) and International Student Barometer (ISB)

D. Staff Development Priorities

- Academic staff undertake activities related to research, scholarship, teaching and learning and student support and guidance
- Annual staff performance and development reviews match development to needs
- Managers undertake a variety of management development programmes
- New academic staff required to undertake appropriate University of Portsmouth learning and teaching programmes
- All academic staff encouraged to seek Higher Education Academy membership

- Academic staff undertake initial and continuing professional development within the Academic Professional Excellence Framework (APEX) programme which is aligned with the Higher Education Academy (HEA)'s UK Professional Standards Framework (UKPSF)
- Support staff are encouraged to attend short courses in areas such as minute taking, and specific IT packages

23. Assessment Regulations

The current University of Portsmouth academic regulations will apply to this programme (*see Assessment and Regulations*[4]).

24. Role of Externals

Subject External Examiners who will:

- Oversee unit assessment and usually attend Unit Assessment Boards
- Review unit assessment strategy
- Sample assessment artefacts
- Present report to Unit Assessment Boards

Award External Examiners (usually also a Subject External Examiner) who will:

- Oversee and attend Award/Progression Boards
- Scrutinise and endorse the outcomes of assessment
- Ensure that the standard of the award is maintained at a level comparable with that of similar awards elsewhere in the United Kingdom

25. Indicators of Standards and Quality

A. Professional Accreditation/Recognition

Professional accreditation is not immediately planned, but students may, for example, join the IET on the basis of obtaining an honours degree. Seeking Chartered Engineer status will be by the 'individual cases route'.

B. Periodic Programme Review (or equivalent)

The School of Engineering (course provision previously in the Department of Electronic and Computer Engineering) was subject to a Periodic Programme Review in December 2012. The Review confirmed the Fitness of Purpose of Curriculum and that the Annual Monitoring and Review Processes are Effective.

C. Quality Assurance Agency

QAA Higher Education Review, March 2015, judgements about standards and quality meet UK expectations (*for full report see Higher Education Review of the University of Portsmouth, March 2015*[5]).

D. Others

The School of Engineering is an IET Academic Partner.

The University has been awarded an Athena SWAN Institutional Bronze Award in recognition of its commitment to advancing women's careers in STEM (science, technology, engineering and mathematics).

[4] www.port.ac.uk/departments/services/academicregistry/qualitymanagementdivision/assessmentandregulations/

[5] www.qaa.ac.uk/en/ReviewsAndReports/Documents/University%20of%20Portsmouth/University-of-Portsmouth-HER-15.pdf

26. Further Information

Further information may be found in:

- Student Handbook
- University of Portsmouth Curriculum Framework Document
- University of Portsmouth Prospectus
- University of Portsmouth[6] and School of Engineering[7] websites

[6] www.port.ac.uk/

[7] www.port.ac.uk/aboutus/

Unit Assessment Map

UNITS						COURSEWORK				EXAMS		
Level	Name	Code	Credit	Delivery	Core/ Option	Total	Type of Artefact	Duration/ Length	Weighting	Total	Duration	Weighting
6	Individual Project	ENG601D2	20	Feb – May	Core	100%	Main Project Report	5000 words	100%			
6	Control Engineering	ENG644D1	20	Sep – Jan	Core	100%	Coursework	4000 words	100%			
6	Electronics	ENG632D1	20	Sep – Jan	Core	100%	Coursework	2000 words	50%			
							Coursework	2000 words	50%			
6	Data Communications	ENG659D2	20	Feb – May	Core	100%	Coursework	2500 words	50%			
							Computer Based Assessment		50%			
6	Digital Signal Processing	ENG643D2	20	Feb – May	Core	40%	Simulation Exercises & Report	2000 words	40%	60%	2 hours (CBT)	60%
6	Operations and Quality Management	ENG603D1	20	Sep – Jan	Core					100%	40 mins (CBT)	40%
											40 mins (CBT)	60%

Unit Learning Outcomes Map[8]

UNITS						LEARNING OUTCOMES																							
Level	Name	Code	Credit	Delivery	Core/ Option	A1	A2	A3	A4	A5		B1	B2	B3	B4	B5		C1	C2	C3	C4			D1	D2	D3	D4	D5	D6
6	Electronics	ENG632D1	20	DL	Core	*	*		*			*	*		*			*	*						*	*			*
6	Digital Signal Processing	ENG643D2	20	DL	Core	*	*	*	*			*	*	*				*							*	*			*
6	Control Engineering	ENG644D1	20	DL	Core	*	*	*	*			*	*	*	*			*	*						*	*	*		*
6	Data Communications	ENG659D2	20	DL	Core	*		*	*			*		*	*					*					*	*			*
6	Operations and Quality Management	ENG603D1	20	DL	Core		*	*		*			*	*				*		*				*		*	*	*	*
6	Individual Project	ENG601D2	20	DL	Core	*			*	*		*			*	*			*	*	*			*	*	*	*	*	*

[8] A = Knowledge and Understanding; B = Cognitive (Intellectual) Skills; C = Practical (Subject Specific) Skills; D = Transferable Skills